Bulbophyllum involutum Borba, Semir & F. Barros (Orchidaceae), a New Species from the Brazilian "Campos Rupestres"

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ABSTRACT. *Bulbophyllum involutum*, a new orchid species from the "campos rupestres" of Brazil, is described and illustrated, with notes about the biology of the species. It is also compared with *B. warmingianum*, *B. ipanemense*, and *B. longispicatum*.

Bulbophyllum Thouars is one of the largest orchid genera, with over 1100 species, and has a pantropical distribution, concentrated especially in the Old World Tropics (Dressler, 1993).

The last revision of this genus for Brazil was that of Cogniaux (1902); many species have been described more recently in various publications. At present, 54 *Bulbophyllum* species are recorded for this country (Pabst & Dungs, 1975, 1977). The lack of a recent revision has led to difficulty in identification of the Brazilian species and has frequently given rise to wrong determinations.

One of the major taxonomic problems in this genus involves a group of species mainly found in the Brazilian "campos rupestres," where about eight of these species are vegetatively uniform, and separation is only possible by use of very subtle floral characters that are difficult to recognize in herbarium material, in spite of relatively easy diagnosis in the field. These problems, in addition to the lack of a revision of the genus, have led to misinterpretations of some species, many of them being wrongly identified as *Bulbophyllum warmingianum* Cogniaux.

In the course of reproductive biology studies of some species of this complex (Borba & Semir, in press), several populations originally interpreted as *B. warmingianum* and *B. ipanemensis* Hoehne were seen to possess some traits that separate them as a distinct species, described as follows:

Bulbophyllum involutum Borba, Semir & F. Barros, sp. nov. TYPE: Brazil. Minas Gerais: São Gonçalo do Rio Abaixo, Estação de Pesquisa e Desenvolvimento Ambiental de Peti, 24 Apr. 1993 (fl, fr), *E. L. Borba 008* (holotype, BHCB). Figures 1, 2.

Bulbophyllo warmingiano Cogniaux, *B. longispicato* Cogniaux et *B. ipanemensi* Hoehne affinis, sed anthesi flore singulari, scapi bracteis floralibus purpureis, floribus purpureis majoribus, petalis ovatis, apice obtuso vel rotundato, basi labelli lobo terminale truncato vel subcordato cum margine involuto differt.

Lithophytic or occasionally epiphytic herbs. Roots thread-like, fasciculate, long. Rhizome 20–51 mm long between pseudobulbs, 3–6 mm diam., repent, covered with paleaceous sheaths. Pseudobulbs 19–41 × 12–22 mm, erect, ovoid, tetragonous, yellowish, monophyllous. Leaves 31–115 × 16–31 mm, sessile, erect-patent, rigid, coriaceous to slightly fleshy, elliptic-oblong to oblong, green, apex acute-apiculate, base attenuate and canaliculate. Inflorescence basal; scape 29–48 cm long, 2–3 mm diam., erect, rigid, purple, with 6–11 sheath-like bracts, 14–18 mm long, purple, later becoming paleaceous, apex obtuse; raceme 11–38 cm long, 11–30-flowered, loose, rachis purple, curved to horizontal. Floral bracts 7.5–10.5 × 3–4.5 mm, ovate, persistent, purple when young and paleaceous at anthesis, apex obtuse. Flowers resupinate by torsion of the pedicel. Ovary with pedicel 4–8 mm long, obconical, purple, sulcate. Sepals coriaceous, ovate-triangular, concave, boat-shaped, acuminate, dorsal face purple, ventral face green with purple spots and points; dorsal sepal 9.6–12.4 × 3.6–4.4 mm, erect; lateral sepals 10.4–11.3 × 3.8–4.9 mm, patent to reflexed, oblique. Petals 3.3–5.1 × 2–3.1 mm, membranaceous, oblique ovate, patent, purple with green spots, apex obtuse to rounded, margin ciliate. Labellum 5.3–8.1 × 2.7–3.9 mm, fleshy, in 45° angle with the column, articulated with the column foot; lateral lobes erect, ear-shaped, ciliate, dark purple with white spots; mid-lobe purple with white apex, concave, base truncate to cordate, apex rounded, lateral margins involute, ciliate; callus dark purple, oblong, proximal half longitudinally sulcate. Column 2.4–3.8 mm long, white with purple spots, with two long,

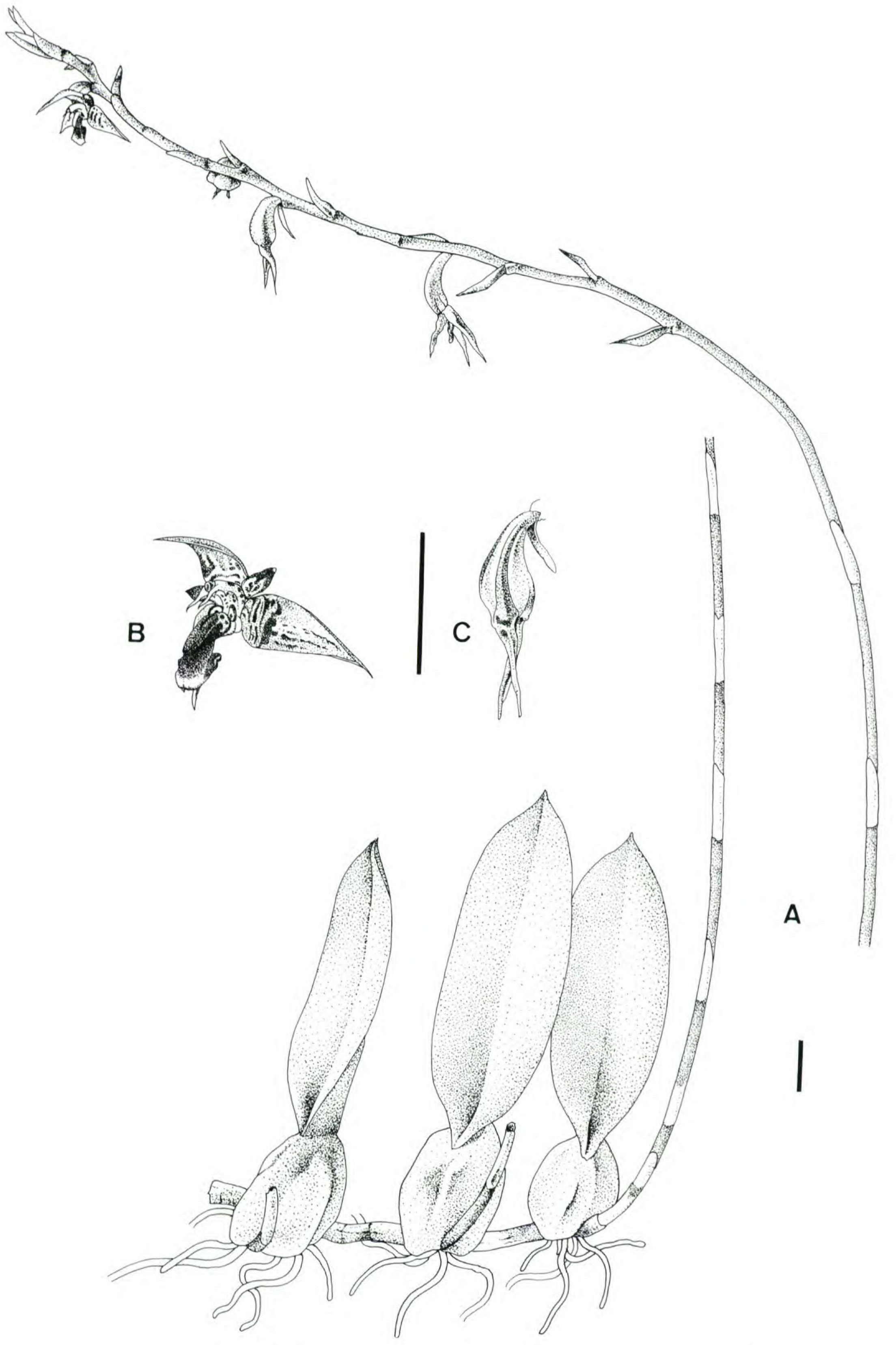

Figure 1. *Bulbophyllum involutum* Borba, Semir & F. Barros. —A. Habit and inflorescence. —B. Flower. —C. Ripe unopened fruit. Scale bars = 1 cm. Drawn from cultivated specimen by Eduardo H. P. Kickhöfel.

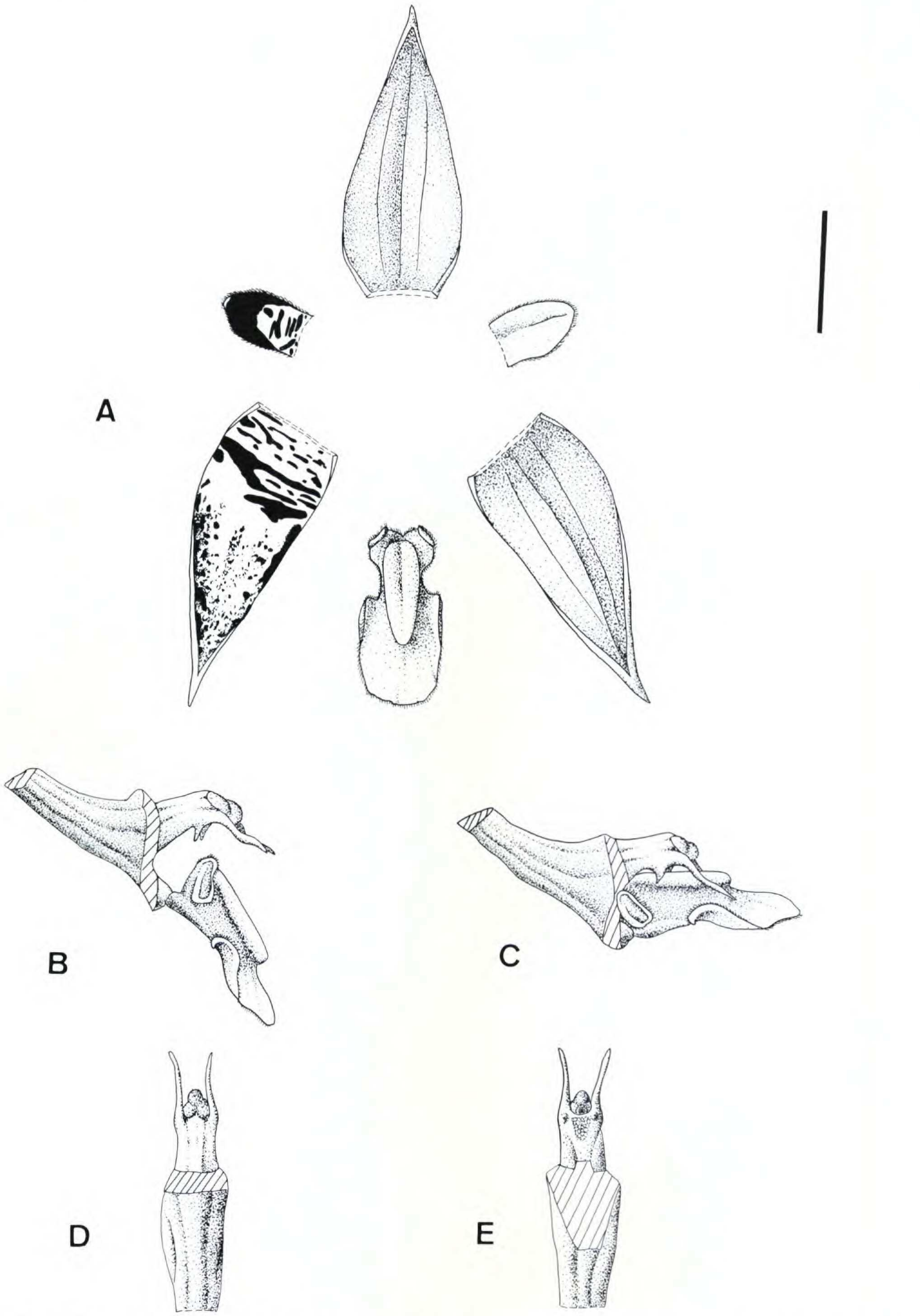

Figure 2. *Bulbophyllum involutum.* —A. Perianth parts; left petal and sepal showing the color pattern of purple spots and points. —B. Ovary, column, and labellum, side view; normal position. —C. Ovary, column, and labellum, side view; labellum bent by the wind against the column. —D. Ovary and column, upper view. —E. Ovary and column, lower view. Scale bar = 5 mm. Drawn from cultivated specimen by Eduardo H. P. Kickhöfel.

sinuate arms or stelidia and two falcate teeth on the ventral face; anther versatile, green, papillose, two pollinia-pairs. Capsule 8.5–12.1 × 6.1–9.4 mm.

Distribution. *Bulbophyllum involutum* grows on rocks or sometimes on trees in the campos rupestres of the states of Minas Gerais and Bahia, along the Espinhaço range. The southern limit of its distribution is São Gonçalo do Rio Abaixo, in Minas Gerais, where it grows on the granite rocks of the foothills of the Espinhaço range, extending to the north along the quartzitic formations of the Serra do Cipó, Diamantina, and Serra de Grão-Mogol, in Minas Gerais, until it reaches Pico das Almas and Mucugê, in Bahia.

In the field, *Bulbophyllum involutum* is easily recognized by its purple inflorescence (flowers, bracts, scape, and rachis), always with a single flower at anthesis, while *B. warmingianum*, *B. longispicatum*, and *B. ipanemensis* have green or greenish yellow inflorescences, with three to five flowers simultaneously at anthesis, as can be seen in the colored plates and descriptions of these species (Warming, 1883; Cogniaux, 1902; Hoehne, 1938). Those traits also aid in the recognition of *B. involutum* in herbarium material, since the purple coloration remains in its sepals, scape, and bracts.

In lip characters *Bulbophyllum involutum* is very close to *B. warmingianum*, while *B. ipanemensis* has a very convex mid-lobe with an attenuated base, and *B. longispicatum* has a long and membranaceous mid-lobe and a callus that is not sulcate. The shape of the petals, ovate with an obtuse apex, is very peculiar compared with those of the other two species, which are always triangular with an acute apex.

Studies of floral biology, both in the field and greenhouse (Borba & Semir, in press), support the establishment of *B. involutum* as a separate species, since some specificity of pollinators occurs at least between this species and *B. ipanemensis*. This could be due to the different composition of odors producing volatile compounds in these two species (Silva et al., in press), which certainly play an important role in the attraction of the pollinators.

Having a single flower in anthesis at a time is a uniform character among the populations studied, observed in all examined individuals of this species (over 150). It also affects the rate and type of sexual reproduction when compared to the other species studied (Borba & Semir, in press).

Like the other *Bulbophyllum* species, *B. involutum* presents an extremely moveable labellum, which is easily bent by the wind against the column. In this species this bending plays an essential role in pollination, trapping the insect (females of *Pholeomyia*, Diptera: Milichiidae) in the column (Sazima, 1978, identified as *B. warmingianum*; Borba & Semir, in press).

Paratypes. BRAZIL. **Minas Gerais:** Diamantina, Serra da Samambaia, 7 Apr. 1980 (fl), *F. Barros 171* (SP); estrada Diamantina/Mendanha, km 585, 6 June 1985 (fl), *H. F. Leitão-Filho 17523* (UEC); Santana do Riacho, Parque Nacional da Serra do Cipó, 3 Feb. 1994 (fl), *E. L. Borba 100* (BHCB); Santana do Riacho, Parque Nacional da Serra do Cipó, região do Congonhas, 900 m, May 1995 (fl), *E. L. Borba 150* (MO, UEC); Santana do Riacho, Serra do Cipó, rio Santo Antônio, 500 m, 27 Apr. 1978 (fl), *G. Martinelli 4412* (RB); Santana do Riacho, Serra do Cipó, km 100, 1000 m, 27 Apr. 1978 (fl), *G. Martinelli 4364* (RB); Conceição do Mato Dentro, Serra do Cipó, km 129, Rio Santo Antônio, 1300 m, 16 July 1977 (fl), *G. Martinelli & A. Távora 2611* (RB); Serra do Cipó, 2 May 1973 (fl), *M. Sazima* (HB herbarium #59402); Grão-Mogol, Vale do Riacho Ribeirão, 900 m, 24 May 1987 (fl), *R. Mello-Silva & J. R. Pirani [CFCR 10866]* (SPF); estrada Grão-Mogol/Montes Claros, 16 Apr. 1981 (fl), *L. Rossi [CFCR 1025]* (SPF, SP). **Bahia:** Mucugê, estrada Mucugê/Cascavel, km 3 a 6, próximo ao rio Paraguaçu, 20 Sep. 1981 (fl), *N. L. Menezes et al. [CFCR 1477]* (SPF, SP); Rio de Contas, Chapada Diamantina, Vale do Queiroz, Pico das Almas, col. in 16 Sep. 1995 and cultivated until flowering in July 1996, *I. Koch & R. Lengruber 452* (UEC).

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